

REMARKS

By this Amendment, Claim 25 has been amended, and Claims 39-42 have been cancelled without prejudice to or disclaimer of the subject matter contained therein, leaving Claims 25, 28-38 and 43-45 pending in the application. Claim 25 has been amended to incorporate the features of Claim 42. Accordingly, the claim amendments (a) do not raise any new issue that would require further search and/or consideration; (b) do not raise the issue of new matter, (c) do not add any additional claims, and (d) place the application in better form for appeal. Accordingly, the amendments should be entered. Reconsideration of the August 3, 2004, Official Action is respectfully requested in view of the following remarks.

First Rejection Under 35 U.S.C. § 103

Claims 25, 29, 33, 34, 37, 38, 42 and 45 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,685,942 to Ishii ("Ishii") in view of U.S. Patent No. 5,772,771 to Li et al. ("Li") and U.S. Patent No. 6,132,512 to Horie et al. ("Horie"). The reasons for the rejection are stated on pages 2-5 of the Official Action. The rejection is respectfully traversed with respect to Claims 25, 29, 33, 34, 37, 38, 42 and 45.

Claim 25, as amended, recites a gas injector for supplying process gas to a plasma processing chamber in which a semiconductor substrate is subjected to plasma processing. The recited gas injector comprises "a gas injector body made of a dielectric material", the gas injector body is sized to extend through a chamber wall of the processing chamber such that an axial distal end surface of the gas injector body is exposed within the processing chamber, the gas injector body including a

plurality of gas outlets adapted to supply process gas into the processing chamber, wherein the gas outlets are located in the axial distal end surface of the gas injector body and the gas outlets being sized to inject the process gas at a sonic or supersonic velocity” (emphasis added). Applicants submit that the gas injector recited in Claim 25 is not suggested by the applied references.

The Official Action asserts that Ishii teaches a “dielectric gas injector 85” comprising a gas injector body 85 sized to extend through the chamber wall 83 of a processing chamber, referring to Figure 4 of Ishii. The Official Action further asserts that the gas injector body includes an axial planar distal end surface exposed within the processing chamber and gas outlets are located in the axial distal end surface. Applicants disagree with these assertions.

The Official Action contends that Ishii teaches a “dielectric” gas injector. However, Ishii’s alleged “dielectric gas injector 85” is a ground electrode in an opening of the insulating material 83. To the extent that the Official Action contends that Ishii’s ground electrode 85 is made of a dielectric material, this assertion is incorrect. In order to be capable of functioning as an electrode in the plasma processing equipment 81, Ishii discloses that the ground electrode 85 is made of a conductor or a semiconductor. The specific group of materials for making the ground electrode 85 that is disclosed by Ishii consists of aluminum (which is the same material as the processing housing 2), Si single crystal, SiC and C (column 4, lines 43-51). Ishii does not suggest that the ground electrode 85 could instead be made of a dielectric material, as recited in Claim 42.

Applicants submit that neither Li nor Horie provides any suggestion or motivation to modify Ishii’s ground electrode 85 to make it of a dielectric material.

Applicants submit that the proposed modification of Ishii advanced in the Official Action would render Ishii's apparatus unsatisfactory for its intended purpose. Thus, the applied references provide no suggestion or motivation to make the proposed modification. See MPEP § 2143.01, page 2100-131.

For at least the above-stated reasons, the gas injector recited in Claim 25 is patentable. Dependent Claims 29, 33, 34, 37, 38 and 45 also are patentable for at least the same reasons as those discussed with respect to Claim 25.

Therefore, withdrawal of the rejection is respectfully requested.

Second Rejection Under 35 U.S.C. § 103

Claims 28, 30-32, 35, 36, 39, 40, 43 and 44 are rejected under 35 U.S.C. 103(a) over Ishii and Li in view of U.S. Patent No. 6,077,357 to Rossman et al ("Rossman") and Horie. The reasons for the rejection are stated on pages 5-6 of the Official Action. Claims 39 and 40 have been cancelled. The rejection is respectfully traversed with respect to Claims 28, 30-32, 35, 36, 43 and 44.

Claims 28, 30-32, 35, 36, 43 and 44 depend from Claim 25. Applicants submit that Rossman also fails to provide any motivation to modify Ishii's ground electrode 85 to make it from a dielectric material, as recited in Claim 25. Accordingly, the gas injector recited in Claims 28, 30-32, 35, 36, 43 and 44 also is patentable.

Therefore, withdrawal of the rejection is respectfully requested.

Third Rejection Under 35 U.S.C. § 103

Claim 41 is rejected under 35 U.S.C. § 103(a) over Ishii and Li in view of U.S. Patent No. 5,734,143 to Kawase et al. ("Kawase") and further in view of Horie. The reasons for the rejection are stated on pages 6-8 of the Official Action.

As Claim 41 has been cancelled, this rejection is moot.


Conclusion

For the foregoing reasons, allowance of the application is respectfully requested. Should the Examiner have any questions regarding this response, Applicants' undersigned representative can be reached at the telephone number given below.

Respectfully submitted,

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